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CHANGES

**IN TRANSPORTATION  
USED BY  
COUNTRY GRAIN ELEVATORS**

MARKETING RESEARCH REPORT NO. 724  
U. S. DEPARTMENT OF AGRICULTURE • ECONOMIC RESEARCH SERVICE

## PREFACE

This study was undertaken by the U.S. Department of Agriculture to determine what changes have taken place in outbound movements of grain from country elevators in the North Central Region since 1958 and to describe how the changes are related to recent developments in transportation.

This work is part of a broad research program of the U.S. Department of Agriculture to determine and evaluate trends in grain marketing and transportation and to analyze their implications. It is also part of the Department of Agriculture's contribution to the North Central Region Grain Marketing Committee's Project--Grain Marketing Institutions and the Structure of Grain Markets (NCM-30).

Data for this study were obtained by mail questionnaires from country elevators in the North Central Region that participated in a 1958 study. This study was published by the U.S. Department of Agriculture in two reports by Robert C. Haldeman, Robert M. Bennett, Joseph R. Corley, Ralph O. Foster, and John H. Hunter, Jr., as follows:

Grain Transportation Statistics for the North Central Region  
Statistical Bulletin No. 268, August 1960.

Grain Transportation in the North Central Region  
Marketing Research Report No. 490, July 1961.

These publications can be obtained from Division of Information, Office of Management Services, U.S. Department of Agriculture, Washington, D.C. 20250.

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## SUMMARY

Between 1958 and 1963, the percent of all grain shipped by truck from country elevators in the North Central Region increased from 30.3 to 40.8 percent. During the same period, barge shipments increased from 1.4 to 2.1 percent. These two increases were offset by a decrease in rail shipments from 68.3 to 57.1 percent. The increase in importance of truck and barge shipments relative to rail shipments was evident for 4 (corn, soybeans, wheat, and oats) of the 6 grains included in the study. Barge shipments of barley and grain sorghums were not reported; but, as with other grains, the share shipped by truck increased, as that shipped by rail decreased.

Country elevators in some producing areas (western North Dakota, western South Dakota, Nebraska, Kansas, Iowa, western Illinois, and eastern Michigan--northern Ohio) shipped a larger share of grain by truck in 1963 than in 1958. The situation in these areas during the 1958-63 period was characterized by a changing level and structure of rail rates that enabled trucks to offer rates and services on some hauls that would attract traffic from the rails.

In two regions, northern Minnesota and southern Ohio, truck shipments relative to rail declined during the 1958-63 period. By 1963, railroads had initiated rates to try to regain traffic previously lost to trucks.

Barge shipments from country elevators in Missouri increased relative to both rail and truck shipments between 1958 and 1963. Improved navigation of the Missouri River helped this shift to barge transportation.

In four areas--southern Minnesota and the three comprising the eastern half of Illinois, all of Indiana, and western Michigan--distribution of country elevator grain shipments among transportation modes remained stable between 1958 and 1963. These areas are near principal grain markets and had access to truck, barge, and rail transportation facilities in the 1958-63 period.

Local sales and shipments of Government-owned grain add to the volume of grain handled by country elevators. Shipments of Government grain move primarily by rail. Neither local sales nor Commodity Credit Corporation (CCC) shipments are significantly affected by changes in transportation, however. Local sales are primarily to livestock feeders in the area and are likely to be picked up at the elevator in feeders' trucks.

Trucks owned or hired by country elevators were used chiefly for hauls to relatively nearby terminal or river elevators. Trucks owned or hired by grain buyers were used when the elevators were supplying feed grains to relatively distant feed deficit markets in the Western and Southeastern Regions.

Changes in the kind of transportation used by country elevators to ship grain depends in part on what rates and services each mode can offer shippers and on distances involved. The presence or absence of backhaul opportunities also affects truckers' activities. For example, this report shows that, between 1958 and 1963, shipments from country elevators in different parts of the North Central Region accounted for by one mode reflected changes in the competitive position of that mode in the area during the period.

CHANGES IN TRANSPORTATION USED BY COUNTRY GRAIN ELEVATORS IN THE NORTH  
CENTRAL REGION--1958-63

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## INTRODUCTION

Economic factors have caused a steady and continual growth in the use of trucks and barges for shipping grain. Recent adjustments in rail freight rates have been aimed at curbing this growth.

### Background of Study

Prior to World War II, grain moved principally by rail. After the war several factors provided a basis for increased use of trucks and barges in moving grain. Highway construction, waterway improvement, and bigger and better equipment connected grain surplus and deficit areas where before railroads provided the only connection. Thus, trucks and barges--either separately or jointly--could quote lower rates than the railroads on some grain traffic.

Rail rates continued to increase during the early and mid-fifties. An index of rail rates for wheat reached a peak of 101 in 1958 (1957-59 = 100), up from 81 in 1951 and 53 in 1943, 1944, and 1945.<sup>1/</sup> Railroads began to make selected rate cuts, but by the time of the last general increase authorized by the Interstate Commerce Commission, October 1960, the rate level had increased 115 percent over the World War II level.<sup>2/</sup>

To measure developments, the U.S. Department of Agriculture made a comprehensive survey of grain transportation in the North Central Region in 1958. It was published as *Grain Transportation Statistics for the North Central Region*, (See Preface) and *Grain Transportation in the North Central Region, an Economic Analysis*, (See Preface).

Data pertaining to country elevators' shipping patterns in those publications have been used in this report to facilitate an analysis of changes between 1958 and 1963.

Since 1958, trucks and barges have continued to play an increasing role in grain transportation. Consequently, railroads--not happy with the continuing loss of traffic--initiated new service with types of rates designed to enable them to regain or share in grain traffic they had lost or were losing.

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<sup>1/</sup> Agricultural Statistics, U.S. Dept. Agr., 1962 and 1963.

<sup>2/</sup> Transport Topics, Bur. Transport Statis., Interstate Com. Comn., Dec. 1961.

In general, the new rates were somewhat lower and caused the rate index mentioned previously to decline from 101 in 1958 (1957-59 = 100) to 99 in 1960 and down to 96 in 1963.3/ The new rates, however, provided limited service for large shipments.

This study was undertaken to assess the magnitude of the changes in transportation used by country elevators in the North Central Region since 1958 and to identify some causes of the changes.

#### Comparability of 1958 and 1963 Studies

Geographic boundaries of areas in the 1958 study have been used in this study (fig. 1).

The data in the two studies are comparable to the extent that (a) information was sought from the same firms and (b) information obtained was adjusted to reflect the quantity of grain handled by country elevators in each of the 20 areas in the studies.4/

Some firms which cooperated in the first study did not do so in the second, however. Uncompleted questionnaires resulted in the second study when participants in the first study either (a) had sold out or gone out of business; (b) had changed the function of their firm to something other than a country elevator, i.e., grain storage or retail farm supply business, including feed; or (c) chose not to return a complete questionnaire.

Data available do not permit the use of statistical techniques to test the accuracy of the estimates of either study. A study of grain shipments from country elevators in Indiana, however, indicated there was no significant difference between data obtained by mail questionnaire and data obtained by personal interview from elevators not responding to the mail questionnaire.5/

A comparison of survey results with off-farm sales 6/ and changes in stocks (both commercial and CCC) 7/ indicates that an exact correspondence between grain moving in commercial channels and survey results is not present, but neither are there major discrepancies.

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3/ Marketing and Transportation Situation, U.S. Dept. Agr., Nov. 1964.

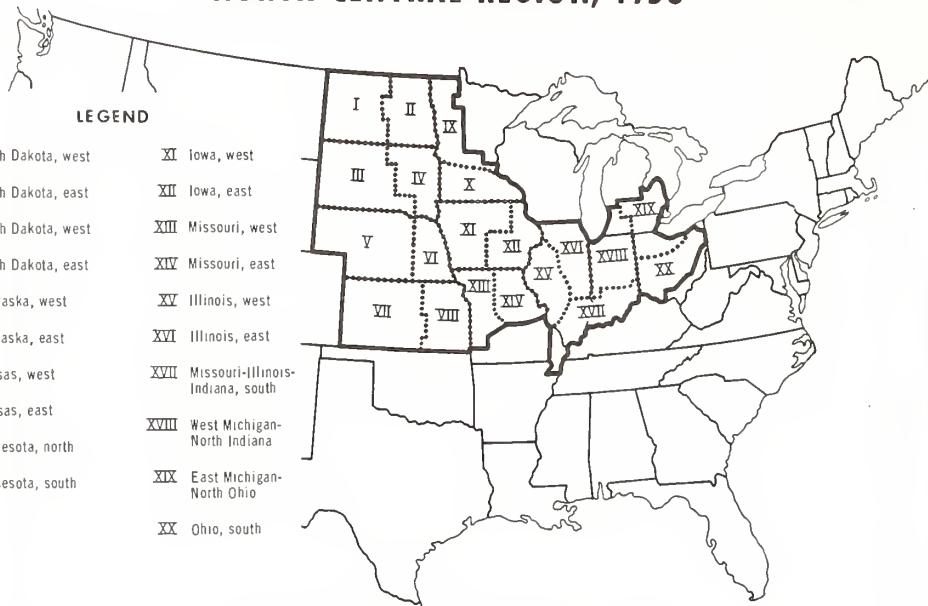
4/ The elevators cooperating in this survey also cooperated in the earlier study. An explanation of the sampling procedure is in Appendix B.

5/ Farris, Paul L., Truck Shipments of Grain from Indiana Country Elevators, 1961-62, Marketing Year. Res. Prog. Rpt. No. 105, Agr. Expt. Sta., Purdue Univ., Lafayette, Ind.

6/ Statistical Reporting Service, Crop Reporting Board. Field and Seed Crops: Production, Farm Use, Sales, Value, By States, 1962-63. U.S. Dept. Agr. Cr Pr 1(64), May 1964.

7/ Grain Market News, Quarterly Summary and Statistics, Agr. Mktg. Serv., U.S. Dept. Agr., 1958-64, and Stocks of Grain in All Positions, Stat. Rptg. Serv., U.S. Dept. Agr., 1958-64.

# GRAIN TRAFFIC AREAS USED IN SURVEY OF COUNTRY ELEVATORS, NORTH CENTRAL REGION, 1958\*



\* CERTAIN ISOLATED AREAS, NOT DEFINED ON THE MAP, WERE EXCLUDED FROM THE SURVEY BECAUSE OF LIMITED GRAIN PRODUCTION.

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Figure 1

Sampling error may have overestimated or underestimated quantities shipped in either study. Such an occurrence is most likely for grains that are relatively unimportant to the area for which the estimate pertains (e.g., soybeans in western Kansas).

In contrast, sampling error should have very little effect on the distribution of shipments among railroads, trucks, and barges. Changes in these relationships rather than of exact quantities shipped are the relevant considerations in relating developments in transportation to changes in transportation used by country elevators.

The 1958 data cover that calendar year. The 1963 study contains data for the marketing year, July 1, 1963, through June 30, 1964. Data in both studies represent a continuous 12-month period. Thus, the period for either study includes both the busy and the slack months of a 12-month period. Throughout the report where 1963 is used, it pertains to the July 1, 1963, through June 30, 1964, period.

## GRAIN HANDLED BY COUNTRY ELEVATORS

Total grain handled by country elevators in the North Central Region in 1963 totaled 3.367 billion bushels. This was 40 percent more than the 2.410 billion bushels handled in 1958, as the following tabulation shows:

	<u>1958</u>	<u>1963</u>
	<u>Thou. bu.</u>	<u>Thou. bu.</u>
Nongovernment shipments	1,805,749	2,627,869
Government (CCC) shipments	315,407	318,086
Local sales	<u>289,011</u>	<u>421,325</u>
Total	2,410,167	3,367,280

Nongovernment grain shipments (grain moving in commercial marketing channels) accounted for 85 percent of the 95.7 million bushel increase. Local sales, primarily for feed and seed, increased 132 million bushels, leaving an insignificant increase of less than 3 million bushels in shipments of Government-owned (CCC) grain.

#### Shipments of Nongovernment Grain 8/

All regions moved more grain into commercial marketing channels in 1963 than in 1958 9/ except the two in South Dakota (table 1, Appendix A).

The decrease in South Dakota is explained by a poor crop year in 1963; wheat production in that year being just over half the 1958 output. In several regions shipments in the two periods were nearly the same. Substantial increases in some areas resulted from either (a) CCC sales related to price support programs, (b) decreases in commercial stocks, (c) increased production that was not needed in the area for seed or livestock feed, or (d) some combination of the above.

In the North Central Region, trucks accounted for 40.8 percent of the grain shipped from country elevators in 1963, up 10.5 percentage points from the 30.3 percent carried in 1958. Barge shipments increased from 1.4 to 2.1 percent. Rail shipments dropped 11.2 percentage points from 68.3 percent in 1958 to 57.1 percent in 1963.

The increase in truck shipments mainly reflects a period when the relation of the level of truck and rail rates was such that trucks could offer their services on some hauls at rates below the rails and thus acquire traffic previously hauled by the rails.

In parts of the region, most of the increase in truck shipments went to river elevators where the grain was transferred to barges for shipment to points of utilization or for export.

8/ When the word grain is used in this section, it includes only grain moving in normal commercial marketing channels and not shipment of Government-owned grain or that sold in the local area.

9/ Data for 1958 are from table 21 of Stat. Bul. No. 268 (See Preface). For tables 2-7 in the appendix of this report the 1958 data are from tables 22-27, respectively, of the same bulletin.

Changes from rail to truck shipments were not uniform throughout the North Central Region. In northern Minnesota and southern Ohio, the importance of rail shipments increased. In Missouri, the importance of both truck and rail shipments decreased; whereas barge shipments increased.

Changes in modes of transportation used for grain shipments from country elevators will be described on a geographical basis so that they can be related to specific developments in the markets for, and marketing of, grain.

References to particular grains and destinations of the trucked grain are included where relevant. The tabular presentation of this material appears in tables 2 through 8.

#### Northwest Areas

North Dakota (I and II), South Dakota, (III and IV),  
and Minnesota, north (IX) 10/

With the exception of considerable corn production in eastern South Dakota, these areas are primarily surplus in wheat, barley, and oats. As in the past, this general producing area is tributary to the Minneapolis-St. Paul and Duluth-Superior markets.

The importance of truck shipments from country elevators increased considerably in western North Dakota (from 6 to 25 percent) and western South Dakota (from 18 to 35 percent) but only slightly in eastern North Dakota (from 8 to 16 percent) and eastern South Dakota (from 35 to 41 percent) between 1958 and 1963.

In contrast, the northern Minnesota country elevators decreased truck shipments from 26 percent in 1958 to 13 percent in 1963.

Special rail rates--with seasonal application to Duluth-Superior and Minneapolis-St. Paul--for grain from specified points in northern Minnesota and eastern North Dakota were in effect for the first time during the winter of 1963. These rates probably increased the railroads' share of country elevator shipments in those areas.

Country elevators at points in western North Dakota that did not have the new lower rates continued the trend toward increasing truck shipments.

#### Southwest Areas

Nebraska (V and VI) and Kansas (VII and VIII)

Wheat is the major grain produced in this area, with the exception of eastern Nebraska where corn production exceeds that of wheat. Grain sorghum production has increased until it nearly equals corn production in the two States.

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10/ Roman numerals correspond to areas in figure 1.

Traditionally grain moved east by rail to Omaha and Kansas City. From 1958 to 1963, shipments by truck in these four areas increased from just over 16 percent to more than a third. The most significant shift was the increased use of trucks for grain sorghum shipments in western Kansas. In 1958, 10 percent was moved by truck. By 1963, the trucks' share had jumped to 85 percent. Destinations for about three-fourths of these grain sorghums were in the Southwest and the West. These markets reflect increased exports from Gulf ports in addition to increased needs for livestock feed in the Southwest and the West.

To further illustrate the increasing importance of the Southwest market, almost twice as much wheat was trucked in that direction as was trucked to Kansas City from western Kansas in 1963 (table 8).

Nearly four-fifths of western Nebraska's truck shipments of corn and grain sorghums went to the Western Region, primarily Colorado. Considerable quantities of these two feed grains were also trucked to the Western Region from eastern Nebraska. The recent growth of the cattle feeding industry in Colorado requires large amounts of feed grains. They could be trucked from nearby surplus areas in Nebraska for less than by rail since the basic rail rate structure was developed to facilitate west-to-east movements.

Rail rates introduced in late 1964 from points in Nebraska to points in the cattle feeding areas of Northwest Colorado were aimed at stemming the increase in truck shipments and enabling the railroads to share in the traffic.

In eastern Kansas, country elevators reported an increase in truck shipments from 13 percent in 1958 to 43 percent in 1963. Ninety-five percent of the wheat trucked within the area went either to intra-area destinations (most likely Kansas City) or to Kansas City specifically.

Much of the grain trucked into Kansas City is transferred to barges for shipment down the Missouri and the Mississippi Rivers to Baton Rouge and New Orleans for export. The growth of this truck-barge movement in part resulted from the fact that rates offered by these carriers were lower than the rail rate applicable from country points in surplus wheat areas near Kansas City to Gulf ports.

Rate adjustments proposed by railroads in 1964 were designed to let the railroads share in the increased truck-barge movement.

North Central Areas  
Minnesota, south (X) and Iowa (XI and XII)

These three areas produce primarily corn and soybeans. Much of the corn produced in the area is consumed there as livestock feed. Continued increases in soybean production have been either (a) shipped out of the area or (b) processed in the area. The soybean meal is fed to livestock, and the soybean oil is shipped out of the area.

Country elevators in southern Minnesota reported using truck and rail transportation in nearly the same proportion in 1963 as in 1958. Most of the

corn is trucked to elevators at or near Minneapolis-St. Paul or other Mississippi River points below Minneapolis-St. Paul. Soybeans are trucked either to (a) interior points for processing, (b) river points for transfer to barges, or (c) the Minneapolis-St. Paul area for processing or transfer to barge.

In western Iowa, the use of trucks increased from 24 to 43 percent of total shipments from 1958 to 1963. This increase largely reflects the advantage of trucks for hauling to relatively nearby feeding, processing, and river markets. The area contains several feed milling and soybean processing facilities and is rather centrally located among terminal and river markets at Kansas City and Minneapolis and in Illinois. The truck-rail distribution of soybean shipments remained fairly stable in eastern Iowa; two-thirds of the trucked soybeans went to interior processors, and most of those remaining were shipped to river elevators.

For corn shipments, however, the truck share of total shipments increased from less than 30 percent in 1958 to over 50 percent in 1963. Over two-thirds of the trucked corn went to river elevators, primarily for barge shipment, although feed is milled in the Davenport, Iowa, area.

#### South Central Areas Missouri (XIII and XIV) and Illinois (XV)

Corn, soybeans, and wheat were the predominant grains shipped by country elevators in these areas. In Missouri, the percentage shipped by barge increased from less than 10 percent in 1958 to over 30 percent in 1963. Both the rail and truck shares decreased. This was particularly true for corn in eastern Missouri, where barge shipments increased from 23 percent in 1958 to 68 percent in 1963. The rail and truck shares of corn shipments declined from 36 to 11 percent and from 41 to 21 percent, respectively. With the growth of barge shipments, a few country elevators in this area (on both the Missouri and the Mississippi Rivers) are beginning to function as subterminal elevators. This pattern of buying grain from inland country elevators developed on the Illinois River some time ago.

In the 1958 study, if an elevator purchased less than one-half of its grain from farmers, it was classified as a subterminal. Such subterminal practices were not yet evident at river elevators in eastern Missouri, for they were classified as country elevators. In this study, the source of the elevator's grain was not ascertained, but some, if not all, of the elevators at river points in eastern Missouri are currently functioning as subterminal elevators.

The earlier development of trucking to river elevators (subterminal) in western Illinois evidently continued from 1958 to 1963. Truck shares of shipments increased from 50 to 69 percent, while rail shipments decreased from 36 to 20 percent. Since most river elevators were classified as subterminals in 1958, barge shipments from country elevators were less important but decreased from 14 to 11 percent between 1958 and 1963.

Nearly all of the trucked corn and wheat from western Illinois country elevators went to river points or Missouri (primarily St. Louis, also a river

point). Trucked soybeans that did not go to river points went to processing plants either in the region or in eastern Illinois (primarily Decatur).

East Central Areas  
Illinois (XVI), Missouri, Illinois, and Indiana, south (XVII),  
and northern Indiana and western Michigan (XVIII)

Corn, soybeans, and wheat are the major grains shipped by country elevators in these 3 areas. All types of transportation are available to different parts of the region. Shifts in traffic among different kinds of carriers between 1958 and 1963 were not prominent on an overall basis.

In the heavily surplus eastern Illinois area, shipments by truck decreased from 42 to 40 percent between 1958 and 1963. Rail rate cuts on feed grains to the Southeast probably reduced the use of trucks in the eastern Illinois area, even though a third of its truck shipments went to the Southeast in 1963 (table 8).

About four-fifths of the trucked soybeans went to processors within the area, the remainder going to river elevators.

In area XVII, truck shipments decreased from 40 to 35 percent between 1958 and 1963. Trucked corn shipments decreased from 72 to 38 percent. One factor contributing to this decrease was the reduced rail rates into the deficit Southeastern feed grain area. Furthermore, almost three-fourths of the corn trucked from country elevators in the area went to river points, where shipment to the Southeast by rail or barge was possible, while less than 20 percent was trucked direct to the Southeast.

In the western Michigan-northern Indiana area (XVIII), truck shipments increased from 43 to 47 percent of total shipments between 1958 and 1963. Truck shipments of soybeans declined slightly--from 49 to 48 percent (table 3). Destinations of the trucked grain were primarily within the area and to Chicago and Decatur, Ill. In addition, considerable corn moved to Ohio River points.

Eastern Areas  
Eastern Michigan and northern Ohio (XIX) and Ohio, south (XX)

Corn, wheat, and soybeans are the main crops shipped by country elevators in these areas.

Even though the areas are next to each other, they experienced considerably different changes in grain transportation from 1958 to 1963.

Truck shipments in the eastern Michigan-northern Ohio area increased from less than a fifth in 1958 to over a half in 1963; whereas in the southern Ohio area, truck shipments declined from 28 to 16 percent during the same period.

The increasing importance of Toledo as an export market after the opening of the St. Lawrence Seaway in 1959 was responsible for some of the increase in truck shipments in the eastern Michigan-northern Ohio area which includes

Toledo. Practically all the trucked soybeans and wheat went to intra-area destinations, primarily Toledo. This was also the major destination for trucked corn; however, a significant share went to the grain deficit Eastern Region.

In southern Ohio, shipments of corn by truck decreased from 46 percent in 1958 to 24 percent in 1963 (table 2). Point-to-point rail rates designed to regain traffic lost to trucks and barges were in part responsible for the increased use of rails to move corn from this area to Baltimore and eastern broiler producing areas with feed deficits.

#### Local Sales

Local sales of country elevators are primarily to farmers in the area for use as seed or feed. The country elevator serves as a more stable source of supply for a farmer than his neighbors do. Furthermore, the country elevator has accurate weighing facilities and is more likely to provide credit.

Corn, oats, and grain sorghums--all feed grains--accounted for over 90 percent of local sales in 1958 (table 19, Stat. Bul. No. 268, p. 31, See Preface) and in 1963 (table 9).

#### Shipments of Government (CCC) Grain

Many country elevators handle grain owned by the Commodity Credit Corporation. Most of the grain is moved from farms or Government storage facilities in the vicinity of the country elevator through the elevator into rail cars for shipment to points designated by the Commodity Credit Corporation. These include mainly interior and export terminals. Volumes of Government grain shipped vary according to relationships between current market prices and CCC selling prices as conditioned by price support program objectives. In 1963, wheat accounted for most of the CCC shipments (table 10). In 1958, corn led in CCC shipments (table 20, Stat. Bul. No. 268, p. 33. See Preface).

#### KIND OF TRUCKERS HAULING GRAIN

Particular kinds of trucking operations provide the best arrangements for making different kinds of hauls.

Trucks owned or hired by the country elevator are used in two kinds of situations. First, the elevator's trucks are used when it frequently ships to markets up to about 50 miles distant. Thus, the country elevator is often able to increase its income by more fully utilizing a truck it already owns to haul grain to higher priced markets. Examples of this situation occur where country elevators truck their own grain to river or nearby terminal elevators (southern Minnesota, western Illinois, and eastern Michigan-northern Ohio areas in table 11). Second, country elevators use shipper-owned or hired trucks when grain can be trucked to its best market for less than if sent by rail, but the buyers at that market do not own or operate trucks. Western North Dakota is an example of this situation (table 11).

Trucks owned or hired by buyers are used when the buyer needs a regular supply of grain but cannot always get it at one place. Livestock feeders in the Western and Southwestern regions pick up feed grains at country elevators in western Kansas and western Nebraska and truck them back to fulfill their feed requirements. Hauls of this nature are considerably longer than those in shipper-owned equipment.

Itinerant merchant truckers, in business for themselves, depend on the buying and selling of grain for livelihood. They buy grain in areas where it is relatively cheap and truck it to areas where they can sell it for more than the purchase price plus their trucking cost. This operation is most evident in movements of feed grains from heavily surplus producing areas to feed grain deficit areas. Nebraska and eastern Illinois provide sources of feed grains which are trucked considerable distances by itinerant merchants to Colorado and the Southeast, respectively (tables 8 and 11).

In general, itinerant merchant-trucker operations lend themselves to feed grains; corn, oats, and grain sorghum are moved significantly more by this kind of trucker than soybeans, wheat, or barley (table 12).

Soybeans and wheat, nonfeed grains, are more likely to be hauled in shipper-owned or hired trucks (table 12).

NOTE: In Appendix tables, 1958 is the calendar year; 1963 is for period July 1, 1963, to June 30, 1964.

Table 1.--Nongovernment grain shipped by country elevators in the North Central Region,  
by origin and mode of transport, 1958 and 1963

Origin	Total shipments		Rail		Truck	
	1958	1963	1958	1963	1958	1963
1,000 bu.						
North Dakota, west . . . . .	51,746	84,432	48,277	63,160	93.3	74.8
North Dakota, east . . . . .	100,314	119,033	92,776	99,600	92.5	83.7
South Dakota, west . . . . .	17,183	13,013	14,157	8,490	82.4	65.2
South Dakota, east . . . . .	79,555	72,685	52,039	43,136	65.4	59.4
Nebraska, west . . . . .	46,182	95,715	37,878	64,341	82.0	67.2
Nebraska, east . . . . .	74,681	93,649	58,744	57,779	78.7	61.7
Kansas, west . . . . .	131,791	173,291	125,406	119,913	95.2	69.2
Kansas, east . . . . .	65,874	105,344	57,234	59,639	86.9	56.6
Minnesota, north . . . . .	55,160	58,187	40,754	50,657	73.9	87.1
Minnesota, south . . . . .	138,003	138,451	66,100	66,606	47.9	48.1
Iowa, west . . . . .	140,886	241,815	106,675	137,280	75.7	56.8
Iowa, east . . . . .	51,755	88,439	32,039	40,622	61.9	45.9
Missouri, west 1/ . . . . .	37,273	40,655	23,571	22,880	63.2	56.3
Missouri, east 2/ . . . . .	27,412	41,270	15,714	13,517	57.3	32.8
Illinois, west 3/ . . . . .	116,530	198,658	41,990	39,446	36.0	19.9
Illinois, east 4/ . . . . .	280,336	524,921	156,410	305,837	55.8	58.3
Percent						
Missouri-Illinois-						
Indiana, south . . . . .	62,973	118,543	37,878	76,406	60.1	64.5
W. Michigan-North	"	"	"	"	25,095	42,137
Indiana . . . . .	154,982	190,945	87,817	101,509	56.7	67,165
E. Michigan-North Ohio . . . . .	134,190	156,455	109,602	69,173	81.7	44.2
Ohio, south . . . . .	38,923	72,368	27,819	60,475	71.5	83.6
North Central Region 5/ . . . . .	1,805,749	2,627,869	1,232,880	1,500,466	68.3	57.1
Percent						
1/ Total includes barge shipments of 224,000 bu. in 1958 (0.6%) and 6,261,000 bu. (15.4%) in 1963.						
2/ " (12.5%) " 18,590,000 " (45.0%) "						
3/ " (13.8%) " 21,877,000 " (11.0%) "						
4/ " (2.2%) " 7,257,000 " (1.4%) "						
5/ " (1.4%) " 53,985,000 " (2.1%) "						

Table 2.--Corn: Volume and percentage distribution of nongovernment shipments by country elevators in North Central Region, by origin and mode of transport, 1958 and 1963

Origin	Total shipments		Rail		Truck	
	1958	1963	1958	1963	1958	1963
	: 1,000 bu.	: 1,000 bu.	Pct.	Pct.	Pct.	Pct.
North Dakota, west ....:	---	77	---	---	---	100.0
North Dakota, east ....:	861	91	33.9	---	66.1	100.0
South Dakota, west ....:	313	---	45.7	---	54.3	---
South Dakota, east ....:	41,044	40,025	54.3	54.7	45.7	45.3
:						
Nebraska, west .......	14,124	28,486	59.3	33.2	40.7	66.8
Nebraska, east .......	35,431	40,926	64.5	39.9	35.5	60.1
Kansas, west .....	1,231	1,143	97.2	---	2.8	100.0
Kansas, east .....	7,155	13,135	58.2	44.3	41.8	55.7
:						
Minnesota, north ....:	5,608	2,243	39.1	88.4	60.9	11.6
Minnesota, south ....:	81,933	86,447	51.5	48.1	48.5	51.9
Iowa, west .....	79,068	147,390	81.8	51.8	18.2	48.2
Iowa, east .....	28,051	51,998	71.2	48.9	28.8	51.1
:						
Missouri, west ....:	6,048	8,332	23.0	72.5	77.0	27.5
Missouri, east <u>1/</u> ....:	6,825	15,931	35.8	10.6	41.1	21.3
Illinois, west <u>2/</u> ....:	46,849	115,949	29.0	15.2	53.2	67.7
Illinois, east <u>3/</u> ....:	154,206	380,653	47.9	55.9	49.4	42.6
:						
Missouri-Illinois-:						
Indiana, south ....:	16,871	48,861	28.3	62.3	71.7	37.7
West Michigan-North :						
Indiana .....	59,905	90,132	56.5	53.8	43.5	46.2
East Michigan-North :						
Ohio .....	41,934	60,437	79.4	40.0	20.6	60.0
Ohio, south .....	18,107	36,384	53.8	76.1	46.2	23.9
:						
North Central :						
Region <u>4/</u> ....:	645,564	1,168,640	56.0	48.6	41.8	48.3
:						

1/ Totals include barge shipments for 1958, 23.1%, 1963, 68.1%.

2/                         "                         17.8%,         "         17.1%.

3/                         "                         2.7%,         "         1.5%.

4/                         "                         2.2%,         "         3.1%.

Table 3.--Soybeans: Volume and percentage distribution of nongovernment shipments by country elevators in North Central Region, by origin and mode of transport, 1958 and 1963

Origin	Total shipments		Rail		Truck	
	1958	1963	1958	1963	1958	1963
	1,000 bu.	1,000 bu.	Pct.	Pct.	Pct.	Pct.
North Dakota, west .....	---	---	---	---	---	---
North Dakota, east .....	1,527	1,652	34.4	28.4	65.6	71.6
South Dakota, west .....	---	130	---	100.0	---	---
South Dakota, east .....	1,822	2,542	48.5	40.0	51.5	60.0
:						
Nebraska, west .....	1,566	1,543	66.7	92.5	33.3	7.5
Nebraska, east .....	3,534	7,886	42.4	68.1	57.6	31.9
Kansas, west .....	456	55	77.6	---	22.4	100.0
Kansas, east .....	2,772	3,895	52.1	46.6	47.9	53.4
:						
Minnesota, north .....	7,848	6,094	46.3	73.8	53.7	26.2
Minnesota, south .....	43,136	44,210	38.0	48.4	62.0	51.6
Iowa, west .....	39,841	84,825	61.0	63.7	39.0	36.3
Iowa, east .....	17,787	33,322	45.6	41.4	54.4	58.6
:						
Missouri, west 1/ .....	8,585	15,037	68.5	54.4	31.5	29.6
Missouri, east 2/ .....	11,313	11,150	62.8	43.8	27.9	27.3
Illinois, west 3/ .....	40,656	50,217	48.5	36.1	42.2	61.3
Illinois, east 4/ .....	77,879	88,274	65.8	67.3	33.0	31.7
:						
Missouri-Illinois-						
Indiana, south .....	30,085	44,940	72.0	69.5	28.0	30.5
West Michigan-North :						
Indiana .....	50,983	52,670	50.8	51.8	49.2	48.2
:						
East Michigan-North :						
Ohio .....	34,110	28,717	79.2	30.6	20.8	69.4
Ohio, south .....	6,868	11,192	81.8	88.1	18.2	11.9
:						
North Central :						
Region 5/ .....	380,768	488,351	58.4	55.6	40.1	42.8
:						

1/ Totals include barge shipments for 1958, 0%; 1963, 16.0%.

2/ " 9.3%; " 28.9%.

3/ " 9.3%; " 2.6%.

4/ " 1.2%; " 1.0%.

5/ " 1.5%; " 1.6%.

Table 4.--Wheat: Volume and percentage distribution of nongovernment shipments by country elevators in North Central Region, by origin and mode of transport, 1958 and 1963

Origin	Total shipments		Rail		Truck	
	1958	1963	1958	1963	1958	1963
	: 1,000 bu.	: 1,000 bu.	Pct.	Pct.	Pct.	Pct.
North Dakota, west ....:	40,969	53,860	93.6	72.7	6.4	27.3
North Dakota, east ....:	52,226	47,862	93.1	86.3	6.9	13.7
South Dakota, west ....:	13,947	10,616	85.4	74.3	14.6	25.7
South Dakota, east ....:	5,581	3,864	92.4	66.7	7.6	33.3
Nebraska, west .....:	25,392	47,027	95.2	87.4	4.8	12.6
Nebraska, east .....:	20,098	23,203	97.9	79.0	2.1	21.0
Kansas, west .....:	97,097	142,912	97.6	80.6	2.4	19.4
Kansas, east .....:	38,240	69,184	93.0	61.0	7.0	39.0
Minnesota, north ....:	11,647	11,635	80.8	87.1	19.2	12.9
Minnesota, south ....:	3,877	4,474	60.3	49.6	39.7	50.4
Iowa, west .....:	4,188	4,260	83.5	80.3	16.5	19.7
Iowa, east .....:	789	900	48.8	0.7	51.2	99.3
Missouri, west <u>1/</u> ....:	15,226	14,874	74.1	51.2	24.4	22.8
Missouri, east <u>2/</u> ....:	7,727	11,336	64.8	36.7	24.8	23.5
Illinois, west <u>3/</u> ....:	24,604	28,542	22.5	9.8	61.9	88.4
Illinois, east <u>4/</u> ....:	27,562	44,087	82.8	72.6	14.1	27.4
Missouri-Illinois-Indiana, south .....	15,254	24,340	73.6	59.4	26.4	40.6
West Michigan-North Indiana .....	38,638	45,782	63.9	53.3	36.1	46.7
East Michigan-North Ohio .....	46,374	53,469	87.7	52.5	12.3	47.5
Ohio, south .....	12,833	21,864	90.3	93.5	9.7	6.5
North Central Region <u>5/</u> .....	502,269	664,091	84.9	69.0	14.0	29.7

1/ Totals include barge shipments for 1958, 1.5%; 1963, 26.0%.

2/ " 10.4%; " 39.8%.

3/ " 15.6%; " 1.8%.

4/ " 3.1%; " .0%.

5/ " 1.1%; " 1.3%.

Table 5.--Oats: Volume and percentage distribution of nongovernment shipments by country elevators in North Central Region, by origin and mode of transport, 1958 and 1963

Origin	Total shipments		Rail		Truck	
	1958	1963	1958	1963	1958	1963
	: 1,000 bu.	: 1,000 bu.	Pct.	Pct.	Pct.	Pct.
North Dakota, west .....	1,993	5,845	68.9	33.7	31.1	66.3
North Dakota, east .....	9,504	12,800	88.2	64.5	11.8	35.5
South Dakota, west .....	1,964	1,624	59.2	14.1	40.8	85.9
South Dakota, east .....	23,658	20,645	70.3	59.4	29.7	40.6
Nebraska, west .....	174	50	44.8	---	55.2	100.0
Nebraska, east .....	1,351	392	87.3	29.6	12.7	70.4
Kansas, west .....	544	---	50.0	---	50.0	---
Kansas, east .....	620	525	52.1	---	47.9	100.0
Minnesota, north .....	16,263	15,766	83.5	88.0	16.5	12.0
Minnesota, south .....	8,643	3,285	55.2	41.8	44.8	58.2
Iowa, west .....	13,732	4,875	76.1	63.1	23.9	36.9
Iowa, east .....	4,979	2,219	70.7	63.7	29.3	36.3
Missouri, west .....	325	340	10.5	65.3	89.5	34.7
Missouri, east .....	113	36	82.3	---	17.7	100.0
Illinois, west <u>1/</u> .....	4,219	3,950	73.4	22.0	23.4	72.3
Illinois, east <u>2/</u> .....	20,425	11,907	40.7	15.6	58.6	80.1
Missouri-Illinois-Indiana, south .....	25	67	100.0	---	---	100.0
West Michigan-North Indiana .....	5,245	2,361	62.7	59.6	37.3	40.4
East Michigan-North Ohio .....	11,160	13,247	73.2	57.2	26.8	42.8
Ohio, south .....	1,097	2,928	79.0	85.6	21.0	14.4
North Central Region <u>3/</u> .....	126,034	102,862	67.9	55.4	31.9	43.9

1/ Total includes barge shipments for 1958, 3.2%; 1963, 5.7%.

2/ " 0.7%; " 4.3%.

3/ " 0.2%; " 0.7%.

Table 6.--Barley: Volume and percentage distribution of nongovernment shipments by country elevators in North Central Region, by origin and mode of transport, 1958 and 1963

Origin	Total shipments		Rail		Truck	
	1958	1963	1958	1963	1958	1963
	: 1,000 bu.	: 1,000 bu.	Pct.	Pct.	Pct.	Pct.
North Dakota, west .....	8,784	24,650	97.6	89.4	2.4	10.6
North Dakota, east .....	35,524	56,628	98.2	87.5	1.8	12.5
South Dakota, west .....	809	643	99.1	37.3	.9	62.7
South Dakota, east .....	4,395	3,124	94.5	95.6	5.5	4.4
Nebraska, west .....	372	---	91.9	---	8.1	---
Nebraska, east .....	52	---	88.5	---	11.5	---
Kansas, west .....	2,271	3,263	73.7	23.1	26.3	76.9
Kansas, east .....	495	913	51.9	3.4	48.1	96.6
Minnesota, north .....	13,771	22,449	86.7	89.9	13.3	10.1
Minnesota, south .....	414	35	95.2	22.9	4.8	77.1
Iowa, west .....	21	---	100.0	---	---	---
Iowa, east .....	7	---	---	---	100.0	---
Missouri, west .....	179	---	---	---	100.0	---
Missouri, east .....	13	---	100.0	---	---	---
Illinois, west .....	31	---	---	---	100.0	---
Illinois, east .....	203	---	26.1	---	73.9	---
Missouri-Illinois-						
Indiana, south .....	168	67	---	---	100.0	100.0
West Michigan-North						
Indiana .....	105	---	70.5	---	29.5	---
East Michigan-North						
Ohio .....	588	585	79.6	100.0	20.4	---
Ohio, south .....	18	---	33.3	---	66.7	---
North Central						
Region .....	68,220	112,357	93.4	85.8	6.6	14.2

Table 7.--Grain sorghum: Volume and percentage distribution of nongovernment shipments by country elevators in North Central Region, by origin and mode of transport, 1958 and 1963

Origin	Total shipments		Rail		Truck	
	1958	1963	1958	1963	1958	1963
	: 1,000 bu.	: 1,000 bu.	Pct.	Pct.	Pct.	Pct.
North Dakota, west ....:	---	---	---	---	---	---
North Dakota, east ....:	672	---	5.4	---	94.6	---
South Dakota, west ....:	150	---	95.3	---	4.7	---
South Dakota, east ....:	3,055	2,485	95.8	95.9	4.2	4.1
Nebraska, west .....:	4,554	18,609	84.8	66.5	15.2	33.5
Nebraska, east .....:	14,215	21,242	94.8	83.0	5.2	17.0
Kansas, west .....:	30,192	25,918	90.0	15.3	10.0	84.7
Kansas, east .....:	16,592	17,692	93.4	55.2	6.6	44.8
Minnesota, north ....:	23	---	---	---	100.0	---
Minnesota, south ....:	---	---	---	---	---	---
Iowa, west .....:	4,036	465	92.1	100.0	7.9	---
Iowa, east .....:	142	---	38.7	---	61.3	---
Missouri, west .....:	6,910	2,072	72.1	39.3	27.9	60.7
Missouri, east .....:	1,421	2,817	74.5	99.0	25.5	1.0
Illinois, west .....:	171	---	20.5	---	79.5	---
Illinois, east .....:	61	---	100.0	---	---	---
Missouri-Illinois-Indiana, south ....:	570	268	32.6	100.0	67.4	---
West Michigan-North Indiana .....:	106	---	52.8	---	47.2	---
East Michigan-North Ohio .....:	24	---	100.0	---	---	---
Ohio, south .....:	---	---	---	---	---	---
North Central Region .....:	82,894	91,568	88.4	55.1	11.6	44.9

Table 8.--Trucked grain destinations, by grain and origin, 1963

Origin	Destination	Corn	Soybeans	Wheat	Oats	Barley	Grain sorghum	Total
North Dakota, west								
	Intra-area .....	26						34
								-----1,000 bu.
								8
	Intraregional:							
	Minn.-St. Paul .....	3,576	684	376				4,636
	Duluth-Superior .....	10,936	988	1,266				13,190
	Minnesota .....	71		26				97
	Nebraska .....			210				210
	Total intraregional	14,583	1,672	1,878				18,133
	Interregional:							
	West .....	51		2,188	712			2,951
	Minor .....			130	16	8		154
	Total .....	71		14,713	3,876	2,606		21,272
North Dakota, east								
	Intra-area .....							215
	Intraregional:							
	Minn.-St. Paul .....	133	1,739	1,918	768			4,558
	Duluth-Superior .....	85	558	4,199	1,534	4,906		11,282
	Minnesota .....			381	54	1,085		1,520
	South Dakota .....				636			656
	Total intraregional	85	691	6,319	4,162	6,759		18,016
	Interregional:							
	Southwest .....							112
	Canada .....	6	428					112
	Minor .....			64	6	211		434
	Don't know .....							478
	Total .....	91	1,183	6,553	4,547	7,059		19,433

Continued--

Table 8.--Trucked grain destinations, by grain and origin, 1963--Continued

Origin	Destination	Corn	Soybeans	Wheat	Oats	Barley	Grain sorghum	Total
South Dakota, west	Intra-area							
	Intraregional:							
	Minn.-St. Paul . . . . .	2,038						2,038
	Duluth-Superior . . . . .	33						33
	Minnesota . . . . .	11						11
	South Dakota . . . . .	33						33
	Nebraska . . . . .	11						76
	Kansas . . . . .	65						65
	Total intraregional	2,126		130				2,256
	Interregional:							
	West . . . . .					403		403
	Southwest . . . . .				829			829
	Don't know . . . . .					599	436	1,035
	Total . . . . .			2,725	1,395	403		4,523
South Dakota, east	Intra-area							
	Intraregional:							
	Minn.-St. Paul . . . . .	2,667						
	Duluth-Superior . . . . .	205						
	South Dakota . . . . .	353						
	Minnesota . . . . .	1,448						
	Kansas . . . . .	91						
	Iowa . . . . .	1,186						
	Nebraska . . . . .	6,133						
	Total intraregional	12,083	1,505	1,277	5,050	126		20,041
	Interregional:							
	West . . . . .	684						684
	South . . . . .	3,511	23	11	2,793	11		6,349
	East . . . . .				103			103
	Minor . . . . .	1,528					103	1,927
	Don't know . . . . .	308				137		445
	Total . . . . .	18,114	1,528	1,288	8,379	137	103	29,549

Table 8.--Trucked grain destinations, by grain and origin, 1963--Continued

Origin	Destination	Corn	Soybeans	Wheat	Oats	Barley	Grain sorghum	Total
Nebraska, west ....								
	Intra-area .....	531			249			216 996
	Intraregional:							
	Kansas City .....			133				133
	Nebraska .....			3,801				3,801
	Iowa .....	116		133				249
	Kansas .....			1,494				1,494
	Total intraregional	116		5,561				5,677
	Interregional:							
	West .....	15,073						5,180 20,253
	Southwest .....	166		66	50			282
	Minor .....	830						249 1,079
	Don't know .....		2,424		66			597 3,087
	Total .....	19,024		116	5,942	50		6,242 31,374
Nebraska, east ....								
	Intra-area .....	5,702		1,070	3,414	127		583 10,896
	Intraregional:							
	Kansas City .....	1,230		297	329			74 1,930
	Kansas .....	1,113			127	11		1,028 2,279
	Iowa .....			382				382
	Missouri .....	106		106	254			466
	Total intraregional	2,449		785	710	11		1,102 5,057
	Interregional:							
	West .....	8,639		636	657	106		1,834 11,872
	Southwest .....	1,844						64 1,908
	Minor .....	4,940		21	95	32		21 5,109
	Don't know .....		1,028					1,028
	Total .....	24,602		2,512	4,876	276		3,604 35,870

Table 8.--Trucked grain destinations, by grain and origin, 1963--Continued

Origin	Destination	Corn	Soybeans	Wheat	Oats	Barley	Grain sorghum	Total
<hr/>								
Kansas, west	Intra-area	11	2,786			188	3,341	6,326
	Intraregional:							
	Kansas City			8,669		55	177	8,901
	Nebraska			89				89
	Illinois			22				22
	Missouri			56				123
	Total intraregional		8,836		55	244	9,135	
	Interregional:							
	West	11				278	5,328	5,617
	Southwest	1,076		15,840		999	10,589	28,504
	Minor	56	44	266		988	2,442	3,796
	Total	1,143	55	27,728		2,508	21,944	53,378
Kansas, east	Intra-area	1,134	1,323	11,550	231	252	3,727	18,217
	Intraregional:							
	Kansas City	105	452	14,395		21	1,396	16,369
	Missouri		304	840		483	609	2,236
	Total intraregional	105	756	15,235		504	2,005	18,605
	Interregional:							
	Southwest	3,958		147	294	126	1,523	6,048
	Minor	651		42			147	840
	Don't know	1,470					525	1,995
	Total	7,318	2,079	26,974	525	882	7,927	45,705

Table 8.—Trucked grain destinations, by grain and origin, 1963--Continued

Origin	Destination	Corn	Soybeans	Wheat	Oats	Barley	Grain sorghum	Total
<b>Minnesota, north . . . . .</b>								
Intra-area . . . . .								
	Intraregional:							
	Minn.-St. Paul . . . . .	66	170	4		46		286
	Duluth-Superior . . . . .							
	Total intraregional . . . . .							
	Canada . . . . .	39	98	472	706			1,315
	Duluth-Superior . . . . .	1,147	1,396	1,307	1,548			5,398
	Total . . . . .	1,186	1,494	1,779	2,254			6,713
	Minor . . . . .							
	Total . . . . .	261	1,594	1,502	1,899	2,274		7,530
<b>Minnesota, south . . . . .</b>								
Intra-area:								
	Interior points . . . . .	203	5,799	149	30	27		6,208
	River points . . . . .	4,405	5,464	890				10,759
	Total intra-area . . . . .	4,608	11,263	1,039	30	27		16,967
Intraregional:								
	Minn.-St. Paul . . . . .	26,108	9,922	1,218	381			37,629
	Wisconsin . . . . .	3,476	1,634		336			5,446
	Iowa . . . . .	1,257			800			2,057
	Total intraregional . . . . .	30,841	11,556	1,218	1,517			45,132
Interregional:								
	Southwest . . . . .							119
	Minor . . . . .							7,845
	Don't know . . . . .							1,782
	Total . . . . .	44,830	22,819	2,257	1,912	27		71,845

Continued--

Table 8.--Trucked grain destinations, by grain and origin, 1963--Continued

Origin	Destination	Corn	Soybeans	Wheat	Oats	Barley	Grain sorghum	Total
Iowa, west .....	Intra-area .....	15,600	16,815	135	645			33,195
	Intraregional:							
	Illinois .....	10,155	600	75				10,830
	Wisconsin .....	450	45					495
	Minnesota .....	25,230	3,420	705				29,355
	Missouri .....	9,195	9,900		900			19,995
	Kansas .....	3,450			75			3,525
	Total intraregional :	48,480	13,965	705	1,050			64,200
	Interregional:							
	West .....	1,800						1,800
	Southwest .....	3,975						4,065
	Minor .....	1,020				15		
	Don't know .....	240						240
	Total .....	71,115	30,780	840	1,800			104,535
Iowa, east .....	Intra-area:							
	Interior points .....	3,648	13,619	864	790			18,921
	River points .....	18,265	5,417	30	15			23,727
	Total intra-area ..	21,913	19,036	894	805			42,648
	Intraregional:							
	Missouri .....	425						425
	Illinois .....	3,952	214					4,166
	Minor .....	198						198
	Don't know .....	106	274					380
	Total .....	26,594	19,524	894	805			47,817

Table 8.—Trucked grain destination, by grain and origin, 1963—Continued

Origin	Destination	Corn	Soybeans	Wheat	Oats	Barley	Grain sorghum	Total
<b>Missouri, west . . . . .</b>								
: Intra-area:								
: Interior points . . . . .		962		59				1,021
: River points . . . . .				2,842	1,199			4,041
: Total intra-area . . . . .		962		2,842	1,258			5,062
<b>Missouri, east . . . . .</b>								
: Intraregional:								
: Kansas City . . . . .		104		947	2,131	74		3,256
: Interregional:								
: Southwest . . . . .						44		414
: Minor . . . . .			1,228		666		888	2,782
: Total . . . . .		2,294		4,455	3,389	118		11,514
<b>Illinois, west . . . . .</b>								
: Intra-area:								
: Interior points . . . . .		3,225		817				4,042
: River points . . . . .		45		1,413	2,286			3,744
: Total intra-area . . . . .		3,270		2,230	2,286			7,786
: Intraregional:								
: Iowa . . . . .						180		180
: Kansas City . . . . .						180		225
: Illinois . . . . .						63		63
: Total intraregional :		45		63	360			468
: Minor . . . . .		81		747	18	36		27
: Total . . . . .		3,396		3,040	2,664	36		9,163
<b>Illinois, east . . . . .</b>								
: Intra-area:								
: Interior points . . . . .		280		2,380				2,660
: River points . . . . .		52,669		11,484	10,018	2,422		76,593
: Total intra-area . . . . .		52,949		13,864	10,018	2,422		79,253

Continued--

Table 8.—Trucked grain destination, by grain and origin, 1963—Continued

Origin	Destination	Corn	Soybeans	Wheat	Oats	Barley	Grain sorghum	Total	
Illinois, west--									
Continued									
	Intraregional:								
	Missouri .....	23,298	9,699	15,084	68			48,149	
	Iowa .....	14	6,622	119	252			252	
	Illinois .....							6,755	
	Total intraregional	23,312	16,321	15,203	320			55,156	
	Minor .....	2,226	574	14	112			2,926	
	Total .....	78,487	30,759	25,235	2,854			137,335	
	-----1,000 bu.-----								
Illinois, east ....									
	Intra-area:								
	Interior points .....	22,774	21,468	551	258			45,051	
	River points .....	45,366	5,645	3,594	2,094			56,699	
	Total intra-area ...	68,140	27,113	4,145	2,352			101,750	
	Intraregional:								
	Indiana .....	8,247				339		8,586	
	Missouri .....	21,942				7,293	191	29,426	
	Total intraregional	30,189				7,293	530	38,012	
	Interregional:								
	Southeast .....	52,873				6,493		59,366	
	East .....	6,254						6,254	
	Total interregional	59,127				6,493		65,620	
	Minor .....	4,770	869	636	170			6,445	
	Total .....	162,226	27,982	12,074	9,545			211,827	
Missouri, Illinois, Indiana, south ...									
	Intra-area:								
	Interior points .....	522	5,078	349				5,949	
	River points .....	12,556	7,649	9,444	67	67		29,783	
	Total intra-area ...	13,078	12,727	9,793	67	67		35,732	
	Continued--								

Table 8.—Trucked grain destination, by grain and origin, 1963—Continued

Origin	Destination	Corn	Soybeans	Wheat	Oats	Barley	Grain sorghum	Total
Missouri, Illinois, Indiana, south--Continued	Interregional:							
	Southwest .....	456		402				858
	Southeast .....	3,524		402				3,926
	Minor .....	1,367		174	80			1,621
	Total .....	18,425	13,705	9,873	67	67		42,137
West Michigan—North Indiana	Intra-area .....	5,805	8,475	4,850	439			19,569
	Intraregional:							
	Ohio .....	5,121	2,219	3,921	387			11,648
	Illinois .....	16,769	13,906	11,327	26			42,028
	River points .....	5,186						5,186
	Total intraregional	27,076	16,125	15,248	413			58,862
	Interregional:							
	Southeast .....	839						839
	East .....	2,322						2,322
	Minor .....	684						710
	Don't know .....	4,954	800	1,303	77			7,134
	Total .....	41,680	25,400	21,401	955			89,436
East Michigan—North Ohio .....	Intra-area .....	24,128	19,500	25,298	3,549			72,475
	Interregional:							
	East .....	6,344						7,982
	Canada .....	195						195
	Minor .....	1,703	442	104	286			2,535
	Don't know .....	3,900						4,095
	Total .....	36,270	19,942	25,402	5,668			87,282

Table 8.--Trucked grain destination, by grain and origin, 1963--Continued

Origin	Destination	Corn	Soybeans	Wheat	Oats	Barley	Grain sorghum	Total
Ohio, south .....	Intra-area .....	2,226	1,295	835	193			4,549
	Intraregional:							
	Ohio .....	24		24				48
	Indiana .....	121	12		60			193
	Total intraregional	121	36	24	60			241
	Interregional:							
	East .....	3,714		36	12			3,762
	Southeast .....	1,924		484	97			2,505
	Minor .....	424		48				472
	Don't know .....	303		61				364
	Total .....	8,712	1,331	1,427	423			11,893

Table 9.--Local sales of specified grains by country elevators in North Central Region,  
by origin, 1963 1/

Origin	Corn	Soybeans	Wheat	Oats	Barley	Sorghums for grain	Total, 6 grains
-----1,000 bu.-----							
:							
North Dakota, west:	287	---	670	2,083	1,785	---	4,825
North Dakota, east:	759	58	923	2,424	3,540	---	7,704
:							
South Dakota, west:	1,907	---	22	2,049	501	130	4,609
South Dakota, east:	19,927	91	34	6,008	239	171	26,470
:							
Nebraska, west ...:	9,943	---	---	979	199	3,469	14,590
Nebraska, east ...:	28,917	297	180	2,374	---	5,046	36,814
:							
Kansas, west .....	433	---	---	688	3,108	37,307	41,536
Kansas, east .....	11,225	116	1,617	1,711	546	8,736	23,951
:							
Minnesota, north ..	9,813	100	192	3,131	690	---	13,926
Minnesota, south ..	31,822	202	30	7,936	65	---	40,055
:							
Iowa, west .....	55,680	3,480	60	10,440	---	315	69,975
Iowa, east .....	25,288	760	---	5,080	---	---	31,128
:							
Missouri, west ...:	7,370	133	207	666	---	932	9,308
Missouri, east ...:	8,036	66	156	403	117	381	9,159
:							
Illinois, west ...:	14,486	23	---	1,720	---	---	16,229
Illinois, east ...:	10,354	318	445	3,490	---	---	14,607
:							
Missouri-Illinois-:							
Indiana, south ..	4,708	2,224	903	93	107	93	8,128
:							
West Michigan-:							
North Indiana ...:	17,995	---	258	4,205	---	---	22,458
:							
East Michigan-:							
North Ohio .....	11,206	546	1,287	4,095	104	---	17,238
:							
Ohio, south .....	6,897	---	24	1,694	---	---	8,615
:							
North Central :							
Region .....	277,053	8,414	7,008	61,269	11,001	56,580	421,325
:							

1/ "Local sales" refers to sales of grain by a country elevator for use as feed, seed, etc., within the general area from which the elevator draws grain.

Table 10.--Government-owned grain shipped by country elevators in the  
North Central Region, by origin, 1963 1/  
(Rail shipment unless indicated in footnote)

Origin	Corn	Soybeans	Wheat	Oats	Barley	Grain sorghum	Total, 6 grains
-----1,000 bu.-----							
North Dakota, west .....	---	---	24,421	863	3,650	---	28,934
North Dakota, east .....	7	---	<u>2</u> /33,423	1,297	<u>3</u> /8,450	---	43,177
South Dakota, west .....	---	---	4,960	164	229	---	5,353
South Dakota, east .....	1,835	---	1,938	376	<u>4</u> /2,690	---	6,839
Nebraska, west .....	13,612	---	13,180	---	---	1,262	28,054
Nebraska, east .....	5/17,946	---	<u>6</u> /9,593	---	42	1,219	28,800
Kansas, west .....	---	---	72,971	---	866	56	73,893
Kansas, east .....	4,253	---	<u>7</u> /22,103	---	158	735	27,249
Minnesota, north .....	---	207	3,448	1,007	8,782	---	13,444
Minnesota, south .....	<u>8</u> /2,188	---	---	10	---	---	2,198
Iowa, west .....	<u>9</u> /17,685	<u>10</u> /555	60	120	---	60	18,480
Iowa, east .....	8,026	494	---	---	---	---	8,520
Missouri, west .....	<u>11</u> /1,746	---	710	---	---	---	2,456
Missouri, east .....	<u>12</u> /1,251	9	22	---	---	990	2,272
Illinois, west .....	<u>13</u> /1,428	294	---	---	---	---	1,722
Illinois, east .....	<u>14</u> /15,569	---	---	---	---	---	15,569
Missouri-Illinois-Indiana, south .....	5,199	---	161	---	---	---	5,360
West Michigan-North Indiana .....	3,522	<u>15</u> /129	---	---	---	---	3,651
East Michigan-North Ohio .....	2,015	---	---	---	52	---	2,067
Ohio, south .....	---	---	48	---	---	---	48
North Central Region:	96,282	1,688	187,038	3,837	24,919	4,322	318,086

1/ Does not include grain which is sold by CCC at binsite and either moves out by truck or is purchased by country elevators.

2/ Includes 660,000 bu. shipped by truck.

<u>3</u> / "	150,000	"
<u>4</u> / "	68,000	"
<u>5</u> / "	710,000	"
<u>6</u> / "	3,625,000	"
<u>7</u> / "	5,166,000	"
<u>8</u> / "	1,238,000	"
<u>9</u> / "	1,650,000	"
<u>10</u> / "	300,000	"
<u>11</u> / "	488,000	"
<u>12</u> / "	982,000	"
<u>13</u> / "	700,000	"
<u>14</u> / "	869,000	"
<u>15</u> / "	129,000	"

Table 11.--Trucked grain shipments, by kind of truck and origin, 1963

Origin	Shipped in your own or trucks hired by you?		Picked up in trucks owned or hired by buyer?		Other (e.g. sold to itinerant truckers at your elevator)?		Total	
	1,000 bu.	Percent	1,000 bu.	Percent	1,000 bu.	Percent	1,000 bu.	Percent
North Dakota, west .....	15,541	73.0	5,272	24.8	459	2.2	21,272	100.0
North Dakota, east .....	10,126	52.1	8,329	42.9	978	5.0	19,433	100.0
South Dakota, west .....	1,265	28.0	1,798	39.8	1,460	32.2	4,523	100.0
South Dakota, east .....	5,792	19.6	12,459	42.2	11,298	38.2	29,549	100.0
:								
Nebraska, west .....	5,494	17.5	14,807	47.2	11,073	35.3	31,374	100.0
Nebraska, east .....	14,299	39.9	6,519	18.2	15,052	41.9	35,870	100.0
Kansas, west .....	13,786	25.8	36,973	69.3	2,619	4.9	53,378	100.0
Kansas, east .....	21,263	46.5	18,132	39.7	6,310	13.8	45,705	100.0
:								
Minnesota, north .....	3,865	51.3	3,552	47.2	113	1.5	7,530	100.0
Minnesota, south .....	58,863	81.9	5,434	7.6	7,548	10.5	71,845	100.0
Iowa, west .....	29,280	28.0	61,650	59.0	13,605	13.0	104,535	100.0
Iowa, east .....	30,024	62.8	11,121	23.2	6,672	14.0	47,817	100.0
:								
Missouri, west .....	8,791	76.4	2,235	19.4	488	4.2	11,514	100.0
Missouri, east .....	4,894	53.4	1,225	13.4	3,044	33.2	9,163	100.0
Illinois, west .....	117,720	85.7	15,557	11.3	4,058	3.0	137,335	100.0
Illinois, east .....	109,045	51.5	60,601	28.6	42,181	19.9	211,827	100.0
:								
Missouri-Illinois-Indiana, south .....	35,678	84.7	3,793	9.0	2,666	6.3	42,137	100.0
West Michigan-North Indiana .....	63,985	71.5	18,912	21.2	6,539	7.3	89,436	100.0
:								
East Michigan-North Ohio .....	72,345	82.9	7,631	8.7	7,306	8.4	87,282	100.0
Ohio, south .....	3,376	28.4	7,852	66.0	665	5.6	11,893	100.0
:								
North Central Region:	625,432	58.3	303,852	28.3	144,134	13.4	1,073,418	100.0
:								

Table 12.--Trucked grain shipments, by kind of truck, 1963

Grain	Shipped in your own or trucks hired by you?		Picked up in trucks owned or hired by buyer?		Other (e.g. sold to itinerant truckers at your elevator)?		Total	
	1,000 bu.	Percent	1,000 bu.	Percent	1,000 bu.	Percent	1,000 bu.	Percent
Corn .....	291,725	51.7	172,713	30.6	100,221	17.7	564,659	100.0
:								
Soybeans .....	160,793	77.0	30,340	14.5	17,671	8.5	208,804	100.0
:								
Wheat .....	142,394	72.0	50,003	25.3	5,360	2.7	197,757	100.0
:								
Oats .....	18,376	40.7	14,190	31.4	12,564	27.9	45,130	100.0
:								
Barley .....	7,261	45.5	7,679	48.1	1,023	6.4	15,963	100.0
:								
Grain sorghum .....	4,883	11.9	28,927	70.4	7,295	17.7	41,105	100.0
:								
Total 6 grains .....	625,432	58.3	303,852	28.3	144,134	13.4	1,073,418	100.0
:								

## APPENDIX B

### Sampling and Expansion Procedure

The method used to obtain data and expand them to represent the population is explained in table 13.

1. Mail questionnaires were sent to all country elevators that participated in the 1958 study (number of elevators in column 2).
2. The number of elevators in column 3 replied that they were out of business in 1963 or the questionnaire was returned marked "undelivered, addressee unknown."
3. The number "out of business" in column 3 was divided by the number in the sample (column 2) to obtain the percent out of business (column 4).
4. This percent applied to the 1958 universe produced an estimate of the 1958 population that was out of business by 1963. This number (column 5) subtracted from the 1958 universe (column 1) gave an estimate of the 1963 universe (column 6).
5. The estimated universe (column 6) was divided by the number of questionnaires completed and returned in 1964 (column 7) to produce expansion factors. These factors (column 8) in turn were applied to the volumes reported on the completed questionnaires from a given area to obtain estimates for the universe.
6. Barley-nonbarley, and river-nonriver portions of one area were sampled and expanded separately, and then added to obtain estimates for the whole area in the areas having heavy barley production (Areas I, II, and IX) or river elevators (Areas X, XII, XIV, XV, XVII).

Table 13.--Deviation of population and expansion factors

Area	Universe 1958	Sample 1958	Number in column 2 out of business	Percent of column 2 out of business	Number in column 2 out of business	Percent of column 2 out of business	Estimated universe 1964	Completed questionnaire 1964	Expansion factor (6) ÷ (7)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
North Dakota, west, barley .....	158	61	2	3.3	5	153	36	4.2	
North Dakota, west, nonbarley .....	224	46	2	4.3	10	214	25	8.6	
North Dakota, east, barley .....	420	175	7	4.0	17	403	118	3.4	
North Dakota, east, nonbarley .....	82	15	1	6.7	5	77	10	7.7	
South Dakota, west .....	164	24	---	---	---	164	15	10.9	
South Dakota, east .....	373	56	3	5.4	20	353	31	11.4	
Nebraska, west .....	272	45	1	2.2	6	266	16	16.6	
Nebraska, east .....	464	81	3	3.7	17	447	42	10.6	
Kansas, west .....	682	101	6	5.9	40	642	58	11.1	
Kansas, east .....	510	77	4	5.2	27	483	46	10.5	
Minnesota, north, barley .....	108	47	3	6.4	7	101	26	3.9	
Minnesota, north, nonbarley .....	128	20	1	5.0	6	122	6	20.3	
Minnesota, south, river .....	21	9	---	---	---	21	5	4.2	
Minnesota, south, nonriver .....	429	66	2	3.0	13	416	42	9.9	
Iowa, west .....	689	100	2	2.0	14	675	45	15.0	
Iowa, east river .....	26	8	---	---	---	26	4	6.5	
Iowa, east nonriver .....	281	41	1	2.4	7	274	18	15.2	
Missouri, west .....	184	33	1	3.0	6	178	12	14.8	
Missouri, east river .....	13	7	---	---	---	13	3	4.3	
Missouri, east nonriver .....	94	14	2	14.3	13	81	9	9.0	
Illinois, west, river .....	91	27	---	---	---	91	8	11.4	
Illinois, west, nonriver .....	301	68	5	7.4	22	279	20	14.0	
Illinois, east, river .....	155	61	2	3.3	5	150	27	5.6	
Illinois, east, nonriver .....	627	92	5	5.4	34	593	28	21.2	
Missouri-Illinois-Indiana, south, river .....	17	6	---	---	---	17	2	8.5	
Missouri-Illinois-Indiana, south, nonriver .....	286	46	5	10.9	31	255	19	13.4	
West Michigan-North Indiana .....	754	122	5	4.1	31	723	56	12.9	
East Michigan-North Ohio .....	543	90	2	2.2	12	531	41	13.0	
Ohio, south .....	392	67	3	4.5	18	374	31	12.1	
Total .....	8,488	1,605	68	---	366	8,122	799	---	

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